

# Knee OA Rehab: Do We Make a Difference?



► Have you ever wondered whether what we do makes a difference with diagnoses that seem chronic, such as osteoarthritis (OA) of the knee? Wood found an association between physical examination of the knee and self-reporting of older people with knee pain.<sup>1</sup> His researchers found that the following components were the ones most highly

associated with pain and functional decline.

- Tenderness of the infrapatellar area;
- Decreased ability to stand on one leg;
- Quadriceps strength;
- Positive patella femoral compression test;
- Range of motion in flexion;
- Girth measurements.

When reviewing this list, it appears that three of the six most significant findings are related to strength.

Strength is not only important for decreasing pain, but also directly relates to function. Eriksrud and Bohannon and Asakawa showed that quadriceps strength, for example, relates to one's ability to get out of a chair and to the rate of falls.<sup>2,3</sup>

Eriksrud and Bohannon showed that a person needs 40 percent of his body weight in the combined quadriceps dynamometry test to be able to get out of a chair without arms.<sup>2</sup> Asakawa found that fallers had knee extension less than 35 percent of their body weight.<sup>3</sup>

Strength training for seniors with knee OA is cost effective. This is important due to health care spending. Sevick in 2000 compared health education classes to strength training classes and found that the strength training classes were significantly more efficacious and cost effective than education only.<sup>4</sup>

## Strength Training

Before getting into the actual programs that have been shown to be effective, let us first examine how effective strength training is for knee osteoarthritis. Several meta analyses and systematic reviews have been done on the topic.

One by Fransen in 2009 examined 32 studies

with more than 3,000 participants and found exercise reduces knee pain and physical disability for people with knee osteoarthritis. This study looked at individual, classes and home programs and found that all were effective.<sup>5</sup> Lang in 2008 reviewed 18 studies and found resistance training improved strength, pain and function.<sup>6</sup>

So with this extremely supportive backdrop to this important intervention, let's review some of the strength training regimens. Baker in 2001 did a progressive weight training program that used two sets of 12 reps three times a week and the intensity was judged on the Borg Scale of perceived exertion.

In this protocol, participants were started light (3 to 5 on the Borg Scale). When they reported a 6 on the Borg and could do 12 repetitions, then the weights were increased.<sup>7</sup>

Topp performed the same protocol as Baker, with a main difference being that the exercises were performed isometrically.<sup>8</sup> Topp's program consisted of supervised exercises performed three times a week for 15 weeks. Baker found that both the movement group and the isometric group improved in both function and pain to the same degree. This is wonderful if a patient is unable to go through the arc of motion. The therapist can do the same program with isometric holds.

Thomas conducted a home-based progressive resistive exercise program for patients with knee osteoarthritis in 2002.<sup>9</sup> This was a two-year program that was self-paced and used graded elastic bands. The physical therapist conducted four 30-minute training visits in the first two months and follow-up visits every six months.

The participants performed the exercises daily for 20 to 30 minutes and adherence was checked through patient diaries. The intensity of the bands was increased when participants could do more than 20 repetitions easily.

## Gaining Resistance

These simple but skilled protocols are a great basis for effective treatment for knee OA. Just strengthening the quadriceps, however, is not enough.

A recent study done by Sled showed that hip abductor strengthening reduces pain and improves function in people with knee OA.<sup>10</sup>

A one-time instruction was performed by the therapist with two follow-up visits. The program used resistive bands three times a week for eight weeks, with individuals performing the following exercises: side-lying hip abduction, standing hip abduction and hip hike on step. The participant exercised until fatigue, with band strength increased when she could perform 20 repetitions of each exercise easily.

Research by Sharma highlights another important point about strength training.<sup>11</sup> This study showed that greater quadriceps strength at baseline was associated with an increased likelihood of OA progression in malaligned and lax knees. This at first looks negative for strength training; however, it is extremely supportive of rehabilitation.

Sharma states in the discussion section how important it is to individualize exercises and not strengthen asymmetry or malalignment. She also states that these patients are ill-served if they go to a gym and just work out. They need the skill of a therapist to set up a program that will strengthen the appropriate muscles.

It's commonly accepted that follow-through of exercises at home is crucial to successful rehabilitation. Therefore, it's important to increase motivation in patients. In 2010, Petursdottir et al published a paper listing influencing factors to exercise.<sup>12</sup> Recognizing how to enhance certain factors, such as positive self-image and health attitude, and helping to solve others, will increase motivation and will make a cost-effective difference for patients with knee OA. ■

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